RADIO SPECTRUM POLICY AND WORLD NEEDS*

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THE RADIO SPECTRUM IS A UNIQUE RESOURCE

The radio spectrum is the basis of the current industrial-technical revolution, thanks to the convergence of computer and spectrum techniques. The function of radio communication is the transmission of information. It is axiomatic that control of the flow of information is the basis of political power. This is so because today the control of the use of all other resources and people depends on the use of information about them, and it is the principal function of the radio spectrum to transmit, retain and receive that information. Nations regard their control of radio communications as essential in establishing and maintaining national sovereignty. In contradiction it is a unique feature of the spectrum that its use by one user depends on the willingness of other users to adhere to engineering standards and frequency allocation plans determined globally by the International Telecommunications Union and its subordinate regional planning bodies. The hard fact is that interference is an inescapable by-product of any use of the spectrum, and only by abiding by the agreed-to standards and allocations plans may it be sufficiently minimized to permit simultaneous use by various classes of users of the spectrum. In short, for one nation or class of user to transmit information through the radio spectrum, all nations and classes of users must also be able to do so. Modern military forces, governments, and business organizations — with all the power at their command — depend on the adherence of everyone to the standards and allocations prescribed by these international agreements. The very system on which their power rests is therefore inherently and inescapably fragile and vulnerable to disruption. Natural forces (e.g., solar flares and other storms), technical factors, bureaucratic blunders and deliberate actions span a wide range of causes of interference, as published governmental studies (e.g., in Sweden and France) have warned. For no other resource is the principal function the transmission, reception, and retention of information; but just that is the original and still principal use of the radio spectrum. By international law, title to the

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radio spectrum does not rest with particular individuals or nations, but with all humanity. For no other resource is common and state property the rule and private property legally impossible. In the International Telecommunications Union which regulates the use of the spectrum every member country has the same vote: one.

To round out our understanding of the uniqueness of the spectrum resource, we must take account of the element of time. While some types of information are less perishable than others (e.g., a population census as against stock market quotations), perishability even in the very short-term is a conspicuous feature of spectrum-mediated information, as the conduct of military forces and international relations proves. And of course, time is linked to pollution in comparing the radio spectrum to other resources. Soils, petroleum, water, air, forests and the ozone layers are pollutable and depletable and their renewal may take millions of years or presently be impossible. With the radio spectrum, however, the "pollution" caused by disruptive interference leaves no physical after-effects once the interference ceases: the spectrum is non-depletable and immediately self-renewing.

Joint decision-making by all nations at the world level regarding the rules for the use of the radio spectrum has been found essential ever since the 1903 conference in Berlin which began the international regulation of the spectrum. Much as one or the other super power might like to withdraw from the International Telecommunications Union (ITU) on occasion, it has proved infeasible. Since 1948, both super powers have at one time or another contemplated trying that road and shrunk back from it. For in order to use the radio spectrum, a nation which pulled out from the ITU would have to try to reconstitute a reasonable facsimile of it and recreate the contradictions within it. One may conclude that in the contradiction between the support-for-national-sovereignty reality of control over the radio spectrum and the world-sovereignty reality, the future lies with the latter.

THE DEVELOPMENT OF THE RADIO SPECTRUM IS ASYMMETRIC

The development of the radio spectrum has been asymmetric: about 10 per cent of the world population enjoys the use of about 90 per cent of the spectrum, while 90 per cent of the population use 10 per cent of it. This corresponds to the principal long-term contradiction between the world's people on the one hand and the system of highly structured hierarchies of privileged classes. The powerful countries of Europe and North America plus Japan dominate that system. This domination is administered conspicuously through the use of the radio

spectrum by their military forces, national diplomacy and the transnational corporations (TNCs) including those which operate the worldwide data processing networks and the mass media. The contradictions between the interests of the highly industrialized countries and those of Third World countries focus on the issue of sovereignty and hence on politico-economic power. If Third World countries are to change the asymmetrical power relations between themselves and the highly industrialized countries, they must own, control and operate their own communications systems. This is as vital to their independence as their military capability. Perhaps it is more vital because foreign control or even influence over a country's communications is a Trojan horse which can immobilize an army and crush movements to maintain or achieve independence.

The initiative in developing the technique of radio was taken in the 1890s by the military (especially the navies) in the highly industrialized countries. Military-industrial alliances engaged the major business enterprises with market interests in electrical systems, especially telephone and telegraph through contracts for research and development leading to equipment manufacturing contracts. These alliances grew very substantially during World War I. By 1920 these corporations were giants and they then added to their continuing liaison with the military market the cultivation of markets for civilian commodities: radio broadcasting, radio communications services for aviation, police, non-military water transportation and improvements in wire telephone and wire telegraph common carrier services.

The fact that civilian uses of the spectrum have been spin-offs from military research and development accounts for the periodic waves of development of the civilian use of the spectrum, which crested again after World War II, during the Cold War of the early 1950s, and in the aerospace race between the super powers after 1958. It also explains the successive development for both military and civilian uses of the higher frequency bands reaching the Super High Frequency band (3-30GHz) in the 1960s and 1970s. Presently in the stage of military exploration are the Extremely High (30-300GHz) frequencies and the Very Low (10-30kHz) and Low Frequencies (used for communicating with submerged submarines).

In this context, it is important to note that David Ricardo's theory of rent fits the radio spectrum and suggests an untapped source of public revenues which might be applied to assist the Third World countries to redress the asymmetry in use of the spectrum. Like land, the radio spectrum is not homogenous in its productivity. The level of economic rent is determined at the 'margin of cultivation'. There is an intensive margin related to the cost of expanding the capacity of previously used radio frequency bands. And there is an extensive margin related to the cost of making usable previously unused or little-

used radio frequency bands. Because of the growth of populaton and industry over time, economic rent is generated by the relative scarcity of the more productive segments of the radio spectrum (as with land). Those licensed to use this valuable spectrum resource at points *within* the extensive and intensive margins receive such economic rent. Radio frequency assignments are the basis of huge industrial profits, conspicuously in commercial TV and radio broadcasting. An indication of the magnitude of the economic rent generated is provided by a Federal Communications Commission (USA) study in 1986, which showed that revenues generated from industries using the broadcast spectrum currently amount to $100 billion a year. If only 10 per cent of such revenues ends up as profit for the industry (a modest estimate), economic rent arising from the private use of the broadcast spectrum in the U.S. alone would amount to $10 billion per annum.[1] As was demonstrated by Henry George, this economic rent is an unearned increment, created by the expansion of society, and it is equitable for society as a whole to recover part or all of it through fees or taxes — especially because the radio spectrum is public property. This is the valid economic argument to support the recommendation by the MacBride Commission that consideration be given to meeting Third World countries' needs for new financial resources by:

> . . .establishment of an international duty on the use of the electromagnetic spectrum and geostationary orbit space for the benefit of developing countries; levying of an international duty on the profits of transnational corporations producing transmission facilities and equipment for the benefit of developing countries and for the partial financing of the cost of using international communication facilities (cable, telecommunications networks, satellites, etc.).[2]

Three 'comments' were attached to this recommendation. Mr. S. Losev (USSR): " 'The idea of an international tax for whatever good reasons or causes does not seem just or justifiable to me.' " Mr. S. MacBride (Ireland) and Ms. B. Zimmerman (Canada): " 'The examples cited, particularly those proposing international duties, seem to have been insufficiently considered in terms of their validity or practicability in the international sphere, and indicate the need for further careful study in this area.' "

About two-thirds of the members of the ITU are Third World countries. Beginning in the 1950s token amounts of technical telecommunications assistance were provided Third World countries with the co-operation of the ITU and other UN agencies. Since 1955 when the Non-Aligned Movement was founded in Bandung, it has co-ordinated struggles for equitable shares of world resources through a range of organizations (ITU, UNESCO, GATT, World Bank, the Club of Rome, etc.). In regard to culture and communication two

issues have been contested sharply: the flow of information (one way or balanced?) and telecommunications policy (*a priori* or market planning of frequency allocation?).

Fundamental to Third World use of the spectrum is equitable access to it. Equitable access rests on some kind of plan for distributing rights to use the spectrum. From the 1890s to the 1970s policy of the ITU was entirely that which the industrialized countries wanted: access on the 'first come, first served' principle, registering their intentions to use particular frequencies as their research and development made their use of the frequencies feasible. The most aggressive in staking out such claims in the spectrum was the United States. Speaking in the 1920s the director of US naval communications said ". . .the most important thing is to get the channels allocated so as to get them registered in the International Bureau before foreign nations [do]".[3] By 1945 in the then most congested portion of the spectrum, 4-20MHz, the US had registered what it referred to as "yardstick channels permanently assigned to American stations" a little more than half of all such channels available to the world.[4]

The laissez-faire 'plan' of first-come served the industrialized countries well — at the cost of vast quantities of stock-piled and unused frequency registrations. Now when the struggle focusses on the congested bands used for satellites in the Super High Frequencies, the political rhetoric from the industrialized countries is that the first-come plan is purely technical and non-political, and is justified in the name of the 'efficiency' in use of the spectrum. As always, one must ask, "efficient for whom"? As a Canadian expert remarks, referring to WARC 1979, "Problems which may be described as having political antecedents were transformed into technical and regulatory solutions."[5] And Richard Colino, Director-General of INTELSAT, said:

> Applications for global systems, filed in the late 1960s, have still not been implemented. A five-year period comes and goes, and people obviously staked out a very strong position to protect themselves. . .One might conclude that both nations (USSR and USA) are staking out positions on a 'first-come, first-served' basis to protect themselves. If that is a fair interpretation, then one certainly has to be at least as generous to the small countries. . .who also want to protect themselves.[6]

The Third World countries favour *a priori* planning through the ITU — a policy which is compatible with the fact that the radio spectrum is common property of all peoples. In 1974 they succeeded in winning the ITU Maritime Conference to agree to a plan which allotted frequency assignments according to a mathematical principle of fairness for the maritime radio service world-wide. When they entered negotiations regarding satellites in the equatorial orbit, Third

World countries had more than simply the international law and custom on radio frequency allocation on their side. Under the Outer Space Treaty of 1967, that orbit is subject to international law. "According to this treaty, outer space is property held in common by all nations, *not subject to claims of* sovereignty or *priority* by one or more administrations."[7] In 1977 they proposed a comprehensive plan for assigning frequencies in the SHF for direct broadcast satellites. They succeeded in assigning to administrations in ITU Regions 1 and 3 (all the world except the Americas) individual frequencies and polarizations at specific orbital locations for coverage of prescribed service areas on the ground.[8]

When they went to the WARC 1979 Space Conference, the Third World countries had a series of demands, most significant of which were: (1) A claim for 70 per cent of the HF band (previously saturated with first-come assignments by industrialized countries). A compromise was reached which ". . .tacitly provides guaranteed access to HF fixed frequencies to developing countries".[9] This was done by cancelling unused HF assignments, and by directing the International Frequency Registration Board (IFRB) to assist developing countries to identify available frequency assignments. (2) The issue of the use of the geostationary orbit and the planning of space services, especially the fixed satellite point-to-point service. India, China, Iraq and Afghanistan proposed a future WARC to plan the fixed satellite service in all SHF bands so as to guarantee equitable access for all countries to the geostationary orbit and to the necessary frequencies. The USA, UK, and France opposed such *a priori* planning, while ". . .the USSR, as a space power interested in only minimal planning, [proposed] that planning be confined to the Broadcasting Satellite Service feeder links".[10] Despite dire foreboding from the US, the equitable access debate did not disrupt the WARC79 Conference. It produced a resolution to hold a Space WARC in 1984 ". . .to guarantee, in practice for all countries, equitable access to the geostationary orbit and the frequency bands allocated to space services." The 1984 Space WARC (postponed to 1985) was to hold two sessions. The first was to "decide which space services and frequency bands should be planned and [to] establish the principles, technical parameters and criteria for planning".[11] The second session would implement decisions taken at the first.

Before the scheduled Space WARC was held there was the Plenipotentiary Conference of the ITU in Nairobi in 1982. It was very stormy. Heated disagreements arose over the efforts of Arab countries to exclude Israel from the Conference. But the central issues were demands of the Third World majority for ITU *a priori* planning of frequency allocations and their insistence that the ITU provide technical assistance and co-operation. The US opposed such technical

aid, supporting instead bilateral aid (which would create markets for TNC exports). In 1983, the Regional Administrative Conference for Broadcast Satellites for Region 2 (the Americas) was held. At it the Latin American countries were persuaded that it was unnecessary to reserve orbital slots for all of them; instead agreement was reached on assigning slots and frequencies with the understanding that other countries might be served via co-operative arrangements.

In the 1985 WARC, the allocation of orbital slots and the ancillary frequencies raised sharply the contradiction between the 'efficiency' so prized by the highly industrialized countries as a result of the first-come policy, and the very different kind of 'efficiency' which prompts the Third World countries to insist on *a priori* plans as a basis of equitable access. The 6/4 and 14/11-12GHz bands are already congested with the satellite services of the first-comers. The necessary research and development of equipment for their use has long ago been done, and the equipment is cost-efficient. It is a good example of the advantage of operating at the intensive margin in Ricardian terms. I will refer to those bands as the 'congested bands'. By contrast, the KU band (12/18GHz), the K band (18/36GHz), and the KA band (26/40GHz) were termed the 'expansion bands'. Equipment for using them is neither well-developed nor cost-efficient. These much shorter frequencies are subject to attenuation of signals during rain storms which are so characteristic of the tropical and subtropical zones, where a high proportion of Third World countries are located. Moreover, the Third World countries are latecomers to high-tech communications and as such are forced to bear costs they are in no position to pay. As a Canadian government report notes:

> Since developing countries are rapidly expanding their use of telecommunications, they do not want to be deprived of equal access to radio frequencies because of late arrival, nor do they want to be forced to use more advanced, expensive technology in order to be guaranteed equal access.[12]

Twenty-two African countries presented an *a priori* allotment plan at WARC85.

> The Africans proposed detailed allotments for four separate plans in the fixed service, the C-Band, KU, 8/7 and 30/20MHz bands. Under the African plan every member of the ITU would be guaranteed a specific orbital position, a global frequency band of identical bandwidth and protection against harmful interference. The African plan would have reserved these slots permanently so that fifty years from now, a country that had made no effort to launch its own satellite would still retain its exclusive rights.[13]

The outcome of the debate at WARC85 was ambiguous. Referring to both the congested and expansion bands (6/4, 14/11 and 20/30MHz) the *Report* stated:

> The planning methods shall guarantee in practice for all countries equitable access to the geostationary satellite orbit and the frequency bands allocated to the space services utilizing it, taking into account the special needs of developing countries and the geographical situation of particular countries.[14]

No administration or group of administrations would have permanent priority to particular frequencies or positions which as a result could foreclose access by other administrations to the orbit and frequency bands. The planning method adopted would provide consideration of the needs of Intelsat, Intersputnik, Inmarsat and other multi-country systems (hereafter Common User Orbital Systems or CUOS). This in effect cast the planning in the context of three types of claimants: (1) the industrialized countries: (2) the Third World countries; and (3) the CUOS.

How is the planning of the fixed satellite service to be conducted? By the device of Multilateral Planning Meetings (MPMs). The procedures to be followed at the MPMs is to be decided at the second session of the WARC-ORB in 1988. In 1985 the guiding principle for the MPMs was to be:

> . . .proportional burden sharing *when appropriate,* while taking into account consideration of existing systems in these bands.[15]

Left undetermined were the questions of the organizational structure and procedures of the MPMs, and of by whom and how the term 'appropriate' were to be defined. The International Consultative Committee for Radio was to meet in May 1986 and the Administrative Council of the ITU in June 1986 to address the interim work before the 1988 WARC-ORB. The intersessional period poses severe political problems for all parties. As Rivera (of the U.S. Delegation to WARC-85) says:

> Top priority is translating principles of the arc allotment program into a detailed set of rules. This will not be easy. . .[There is] still no real consensus as to how much bandwidth should be set aside for planning. Even if that. . .can be resolved, countries will still be left with the politically sensitive task of agreeing on the mechanics of an allotment plan. Effective intersessional work is also needed to resolve two other pending issues. The first is the method of coordinating the use of the C and KU band. The conference endorsed the idea of improved procedures but failed to spell them out.[16]

As of late 1986, it appears that the global sales offensive of the giant TNCs presents severe problems to Third World countries in the latter's efforts to redress the asymmetry in the use of the radio spectrum (and other resources whose future depends on the radio spectrum):

(1) Under the MPM procedure, no orbital positions are assured for the Third World countries. Almost all of them are poor in skilled

technicians, international negotiators, and financial resources. The MPM procedure will strain their inadequate means.

(2) The CUOS organizations will now be parties to the MPM proceedings. It is argued by some of the highly industrialized countries that the CUOS can meet the needs of Third World countries for indirect access to the orbiting satellites — and some of the latter may agree with this view, thus potentially splitting the Third World struggle. It must be recalled in this connection that the CUOS are *not* operated on a one-country, one-vote basis, as is the ITU, but on voting proportionate to investment, like the World Bank, and the veto power in the CUOS always resides in the super powers and their close allies. In 1984 the USA had 23 per cent of Intelsat's investment, the USA, UK and France had 42 per cent. Those three plus Japan, the FRG, Australia, Saudi Arabia and Canada had 61 per cent. The remaining 99 investing countries (92 per cent of the investors) held 39 per cent. Moreover, even if the CUOS were dedicated to serving Third World needs, as M.D. Sant, of the International Frequency Registration Board observed, "If one or two countries occupy a high percentage of the usable orbit/spectrum resources, they prohibit the common user organizations from serving the needs of many other ITU member countries".[17]

(3) Privatization of fixed satellite service has proliferated in the highly industrialized countries, especially in the United States. Miguel Sanchez Ruiz, representing Mexico, has pointed out that:

> . . .competition would tend to reduce the availability of orbital slots and frequency spectrum to the detriment of developing countries. The 'panacea' of new services and technology can't be envisioned through the proposals submitted for international competition. Technology transfer requires better mechanisms. Competition is not a solution.[18]

(4) The Maitland Commission has led the ITU into a massive, multipronged campaign to advance the cause of high technology digital equipment for Third World countries. Established by the Nairobi ITU Plenipotentiary Conference in 1982, the Maitland Commission's report called for programs estimated roughly at US$12 billion. It proposed a broad program designed to bring a telephone within easy reach of all mankind by early in the 21st century. To reach that goal, it urged that a number of steps should be taken: (a) Countries and international agencies with development assistance programs should give higher priority to telecommunications in order to increase the flow of resources in this field; (b) Those entities that provide international satellite systems should consider the feasibilty of establishing funds to finance Earth segments and terrestrial facilities in developing countries; and (c) Member states of the ITU should consider a rearrangement of their international traffic accounting procedures with the aim of setting aside a small proportion of

revenues from calls between developing and industrialized countries to be used to help the developing countries concerned improve their telecommunication networks.[19] The Commission also recommended establishing a revolving fund to assist in equipment purchase, the establishment of telecommunications investment trusts, and emphasized the importance of training Third World nationals in telecommunications matters.

The Maitland Commission went beyond these relatively neutral-sounding proposals to make other recommendations which were more heavily loaded with capitalist ideology. It urged (d) immediate installation of state of the art digital equipment in the Third World even though admitting that ". . .data communications or even broadband communications is not as significant at the moment in the Third World as is transmission of telephone signals. . .".[20] It also conceded that:

> . . .when telecommunication networks in the developing world are extended to provide advanced data communication facilities, entities in industrialized countries who would normally operate such facilities, may gain advantages with respect to information on trade and market conditions. To avoid this there needs to be closer cooperation between industrialized and developing countries in the data communications field.[21]

It is impossible to conceive of 'closer co-operation' between Third World countries and the giant TNCs which would *prevent* the latter and their respective intelligence agencies from monitoring Third World country communications about trade, market, and their own military establishments and activities. Such blatant national sovereignty considerations aside, it is difficult to understand how Third World countries would buy the equivalent of Cadillacs when what they need are Jeeps. As the report by Mosco and McAllister for the Canadian Department of Communications says:

> . . .digital equipment is extremely expensive to acquire, install, and maintain. Developing countries lack the technical expertise and resources to provide their own technicians to install and maintain such systems. Instead of installing less expensive telephone equipment that would adequately serve the needs of many administrations, such nations will be dependent on technological developments and competitive market forces at work in industrialized countries. This threat to sovereignty will not be lost on many Third World decision-makers.[22]

(e) The Maitland Commission further proposed that the ITU serve as a marketing agent for high-tech equipment from the industrialized countries. The ITU should, in its view, in co-operation with manufacturers of telecommunications equipment and components, compile and keep up-to-date a comprehensive catalogue of telecommunications suppliers and systems currently available. It

pointed out that the developing countries ". . .are a fast-growing and potentially the largest market for telecommunications equipment and should be highly attractive to manufacturers in industrialized countries".[23] Mosco and McAllister pose the question: is the call of the Third World for equitable access to the spectrum to be responded to by transforming the ITU into a marketing vehicle for large telecommunications manufacturers? (f) The Maitland Commission ideological offensive went further and recommended that the common practice of Third World countries of operating their telecommunications facilities within public bodies (usually PTTs) be abandoned and that private enterprise conduct them. And "If a complete separation of telecommunications [from the public sector] is not immediately feasible, then gradual steps should be taken towards internal autonomy".[24] (g) The last major recommendation of the Maitland Commission was the creation within the ITU of a centre for telecommunications development. It envisaged the Centre as consisting of: (i) a development policy unit to ". . .collect information about telecommunications policies and experience . . .and to make the results available to developing countries to help them formulate policies for the evolution of their own networks"; (ii) a telecommunications development service to "advise developing countries on creating and operating an effective telecommunications system"; and (iii) an operations support group to "provide specific assistance including preparation of plans, preparation of specifications for projects, assistance with manpower planning and training, management assistance, assistance in research and development and so on".[25]

The ITU promptly held the "First World Telecommunications Development Conference" in Arusha, Tanzania, which approved the Maitland recommendations in May 1985. In July 1985, the ITU Administrative Council established the Centre for Telecommunications Development. An Advisory Board of 21 country members was created and such TNCs as ATT and Hughes Aircraft as well as organizations of telecommunications users (ITUG, ICC) undertook to lobby governments and private sector organizations for financial support of the Centre.

While the foregoing analysis deals with the contradiction between the first come and *a priori* planning methods within the ITU, at a deeper level, the advanced industrial countries enjoy a great advantage over Third World countries. From the beginning, the industrialized countries employed within the ITU the practice of multilateral planning committees. This was built into the style of work of the CCITT and CCIR. A current example is the work being done preparatory to a World Administrative Telegraph and Telephone Conference for 1988. This will follow the CCITT Plenary Assembly in

1988 ". . .to consider proposals for a new regulatory framework to cater for the new situation in the field of new telecommunication services".[26] The initiative for the WATTC-88 was taken by Japan, which sought to have exclusive ITU jurisdiction (as distinct from OECD, GATT, or the Intergovernmental Bureau of Informatics) over:

> . . .new problems relating to telecommunications such as the structure of the information service industry, the economical influences, international data flow, protection of data or the information gap among the nations.[27]

Such a conference has been gestating for at least ten years, since the operational convergence of computers and telecommunications became a fact. My present purpose is not to question its appropriateness, but to call attention to its mode of operation. By framing the WATTC as a telegraph and telephone conference, as Rutkowski says, ". . .the T & T side of the ITU house retained jurisdiction over the proceedings."[28] The distinction is important. Beginning over a century ago, when the major powers created the International Telegraph Union, the T & T conferences typically have been short meetings which ratify the results of multilateral working group meetings.

> This studied deliberative process over a four-year period which places great emphasis on consensus, stands in stark contrast to that of administrative radio conferences, which generally attempt to accomplish all the work during one or two frenetic and occasionally contentious sessions. . .[29]

Over the past ten years scores of working groups and working parties have been at work preparing for WATTC-88. The scope of their work is very broad, ranging from definitions of services, to changes in the monetary unit used for international telecommunication billing. What is involved is the precise definition of terms, i.e., the reality which will prevail. The core concern has been advancing the cause of the industries which favour the Integrated Services Digital Network.

The Third World countries will be fundamentally bound by the WATTC-88 and therefore by the work of the study committees, working groups, etc. which will underlie it. But they have been and will be mostly excluded from those committees — not because they would not be permitted to participate in them, but because most of them would not know what to say if they did, and they have not the funds to pay their expenses. For example, Rutkowski summarizes the work of just *some* of these committees in 1985-86. In that period it appears that six meetings were held by committees or subcommittees at which some 28 countries were represented by some 89 representatives. Fifteen countries contributed documents for discussion of which two (Philippines and Brazil — one apiece) are

Third World countries. The remaining 27 documents came from highly industrialized countries. Why were the bulk of the Third World unrepresented? Because they lacked the expertise, negotiators and funds to pay the costs of participation.

While the Third World countries have begun to use their potential power in the ITU to redress the gross asymmetry in their access to the radio spectrum, the response of the industrialized countries has moved from crude attempts to block the demands of the Third World to a counter-offensive strategy to co-opt Third World initiatives and convert them into new, large and profitable markets for high-tech equipment. The odds seem against the Third world in the present bargaining frame in the short-run.

THIRD WORLD EDUCATION FOR USE OF THE RADIO SPECTRUM DESERVES SUPPORT

There is an obvious case to be made for a program to train middle-and senior-level officials of Third World countries in regard to radio spectrum allocation and management *where the auspices of the program are provided by the Third World.*

The Third World market for telecommunications equipment is estimated by a senior State Department officer to be about US$9 billion, and while this is small in relation to the market in the industrialized countries it is growing vigorously at about 15 per cent per annum.[30] In 1985, the world market for telecommunications equipment was dominated by the European Community (31 per cent down from 35 per cent in 1982), the USA (33 per cent), and Japan (17 per cent up from 12 per cent in 1982).[31]

Aided by the high-tech puffery of the Maitland Commission report, the advanced industrialized countries are moving aggressively to sell their hardware and software. Because the Third World countries are so poor, credit is needed: the sellers are able to offer generous loans, thanks to their governments' co-operation. Because the Third World countries generally lack skilled technicians to install, test and run demonstrations *in situ,* the sellers send their engineers and technicians. Because the Third World countries lack trained operational personnel, middle- and senior-level administrators, the sellers provide training for Third World people in a variety of institutional mixes. What is offered by the most successful sellers is thus a complete package: equipment, installers, and instruction. Japan, France, Italy, Sweden, and West Germany are leaders in providing these packages. Japan in 1981 ". . .granted over $300 million in subsidized loans for telecommunications projects in 40 LDCs and provided free training to 2,000 LDC engineers and technicians".[32] The USA's TNCs are

handicapped currently in this competitive race by a variety of factors. The USA has no three-element package to offer (credit, technical assistance, and training programs). Because the World Bank's practice is to require the Third World country to pay for 65 per cent of telecommunication project loans, the contracts tend to go to countries (especially Japan) which provide subsidized loans to the borrowing country. When it pulled out of UNESCO, the US announced that the $47 million it had paid to UNESCO would be applied to Third World bilateral loan programs. But when the State Department and the TNCs put together such a program it was deleted from the 1986 budget by the White House. The Export-Import Bank is hampered by its inability to grant subsidized loans and in any event the White House has made major cuts in that Bank's budget. The US AID program has given no financial support to telecommunications purchases in the Third World, except for one project in Egypt. Moreover, the US telecommunications industry is trying to recover from the Japanese invasion of its domestic market which was spurred by the freeing of the ATT operating companies from the necessity to buy their equipment from Western Electric (a side effect of the antitrust decree). One affirmative step taken by the US telecommunications industry is the creation of an industry-operated Telecommunications Training Institute which in 1985 gave free training to some 400 engineers and planners from the Third World. As one State Department officer said, in the absence of subsidized credit, ". . .the net effect of our training programs will be to teach LDC technicians how to use somebody else's equipment".[33]

When delegations from Third World countries attend ITU conferences they are handicapped by gross disparities as compared with delegations from highly industrialized countries. This is evident in the mere size of their delegations, and the fact that very few of them send delegations to the host of preparatory committees and working groups which conduct ITU negotiations between conferences. In turn, this is due to their lack of sufficient funds, and shortage of experts in negotiation and technical knowledge. A member of the US delegation to WARC-79 identified the problem as follows:

> The frantic pace produced by the working structure and the ten week time limit of WARC-79 tended to disfavor Administrations who had a small number of delegates. Without adequate personnel, the developing countries could not possibly be present at the numerous Working Groups, Sub-Working Groups, Ad-Hoc Working Groups and Sub-Ad-Hoc Working Groups going on simultaneously at WARC.[34]

Codding studied the factors which determine the influence of a member country at the WARC-79. He determined the 'overall influence ranking' of the delegations present there, scoring them from zero to a maximum of ten. A total of 58 countries were found to have

significant influence rankings. France and the USA scored 10 each, followed by the UK with 9. Other major industrialized countries with 7 points each were Australia, Canada, West Germany and the USSR. The scores for those seven delegations aggregated 57 influence 'points'. At the other pole, delegations from 58 of the 142 delegations present were found to have zero overall influence rankings. Twenty delegations had influence rankings of 1 each, and eight countries, 2 each, and another eight, scores of 3 each. The aggregated influence rankings of these 36 countries was 60 'points'. Third World delegations with high overall influence rankings were Algeria, India and Iran (with 7 points each).[36]

Codding's measure of 'influence' of a delegation combined: (1) 'reputational influence', based on interviews during the Conference and letters sent to delegates post-conference; (2) 'positional influence', the counting of offices held by delegates in the conference and its hierarchy of committees and working groups; and (3) 'behavioral influence', based on analysis of the record of Committee 5 (dealing with the frequency allocation table). It took into account the number of arguments in which a delegation was involved, the number of arguments 'won' by a delegation, and the total number of recorded arguments.

The independent variables which were then correlated with 'influence' were, for each member country: (1) its Gross National Product; (2) technology (telephones, radios and TVs in use and the production of radio and TV sets); (3) size of delegation; (4) pages of proposals submitted at the Conference; (5) experience of delegation members (their participation in all ITU conferences from 1966 to 1979, the 1978 CCIR Preliminary Conference for WARC-79 and the ITU's Administrative Council); (6) frequencies (the number of frequencies between 10.2 and 28,900kHz 'notified' by countries to the ITU's International Frequency Registration Board for inclusion in the Master International Frequency Register) — an indication of the interest of a country in radio communication. The Pearson correlation coefficients significant to 0.001 between the independent variables and 'influence' was strongest for 'size of delegation' (0.63), followed by 'pages of proposals' (0.58), and 'frequencies' (0.53). The larger the delegation, the more experience the delegates had (0.79) and the more pages of proposals introduced (0.82). The weakest correlations were for GNP and technology (0.42 and 0.43).

There were 142 country delegations participating in WARC-79, with a total of 1,675 delegates. The mean size of delegation was 11.8 delegates but the median was three delegates per delegation. The disadvantage of the smaller mostly Third World delegations is indicated by the fact that 73 per cent of the delegations were smaller than the mean and contained only 9 per cent of all the delegates. And

24 per cent of the delegations contained three or fewer delegates, for a total of 4.5 per cent of all the delegates. At the other end of the scale, the French delegation with 87 delegates considerably outnumbered the total of 76 delegates attending for the 34 countries which sent three or less delegates each. And the five countries sending the largest delegations (France, 87; USA, 65; Federal Republic of German, 51; Japan, 49; and the United Kingdom, 48) sent a total of 300 delegates, while the 74 countries (more than half of all countries at the Conference) with seven or less delegates each, were represented by a total of 284 delegates. An asymmetric struggle indeed!

Why does the Third World not send more influential (and therefore larger) delegations with more experience and more prepared materials to contribute than it does? Tran Van Dinh, on the basis of life-long study and action in the Third World, summarizes the reasons for its weaknesses in international telecommunications:

> (a) Lack of long-range preparations and short-range options. Except for Algeria, India and Iran, practically all Third World countries attend international telecommunications conferences without adequate pre-conference preparations (position papers, internal division of responsibilities and internal integration of preparations, the procedural and technical aspects of the conference, agenda analysis, development of optional tactical proposals, strategy and tactics to be followed during the conference, analysis of potential opponents' probable strategies and tactics, development of potential conference allies, etc.), co-ordination and liaison during the conference as well as communication with the home office, and preparation of post-conference lines of action.
>
> (b) Absence of regional co-ordination, consultation and tacit working alliances as well as absence of fundamental research on relation of telecommunicatons technology to self-reliant development of Third World countries.
>
> (c) Fear to politicize issues and undue admiration for the 'technolgoical' superiority of Western delegations.
>
> (d) Lack of mass support or understanding by people at home of the vital issues involved in the negotiations.
>
> (e) Lack of grasp of the international situation, its contradictions and the place of the countries in the Third World in that situation.
>
> The general excuse given for these weaknesses is 'lack of trained personel', and the means available to train personnel to do their duties without undue interference by 'illiterate' politicians. This excuse can be explained by a host of reasons. But the fact is that because of lack of trained personel, the need for preparations and training is the more urgent. The lack of preparation, the ignorance of the agenda and conference procedures leads to intransigence (which is very different from hard political arguments) and self-isolation by some and/or total capitulation or corruption by others.

Underlying these considerations is the Third World's views of telecommunications. There are two main, prevailing views of telecommunications by Third World governments and peoples:

(a) The majority view is that of distrust or even camouflaged hostility. This is rooted in the historical perception of telecommunications as a basic means of Western domination. The following two lines of a Vietnamese folksong (circa 1900) describes the sorrow and the humiliation of a country colonized by Westerners and the role of telecommunications in that dependency relationship:

> Ke tu'ngay that thu kinh do
> Ong tay qua giang giay thep, hos dia do nuoc Nam.
> (Since the fall of the nation's capital,
> the Westernman came, put up the telegraphic poles and mapped Vietnam.)

They accurately express the historical emotions of Third World countries which regained independence after World War II. A good training would transform this emotional hatred — which is now a source of an artificial superiority complex or a retreat into rigid cultural nationalism — into a precise and rational understanding of colonialism, national development and imperialism.

(b) The majority view is a mystified attitude toward Western 'technology' in general and 'high technologies' of telecommunications in particular. This leads to an exaggerated belief in the importance of communication and telecommunications as *the* major factor for development, for 'modernization', and for 'catching up with the West'. This view also results in misplanning and mismanaging of national priorities, in corruption (accepting bribes) and in alienation of government from the people. Fascinated by 'high technologies' and gadgetry, the holders of this view would most likely after training, stay behind and find jobs in a Western country. This is the 'brain drain' Third World countries complain about. A good training program would turn this fascination into scientific curiosity and a search for a true, material understanding of the role of technology and telecommunications in Western societies.

The objective of our proposal is to develop a number of political and administrative experts who are well informed enough to be self-confident in international negotiations and well-trained enough to be self-reliant. A well trained negotiator would succeed in pursuing his country's interests, while reconciling them with regional interests, and harmonizing them with the general interests of the world. He (she) would not be so intransigent as to be disruptive and isolated, nor so weak as to seek compromise at every difficulty and conflict. Such training would minimize the tendencies to conflict and cleavage between political and administrative officers, between generalists and experts. Self-confidence and self-reliance are proclaimed aims of Third World organizations such as the Non-Aligned Movement.[36]

Tran Van Dinh and I prepared a plan and course of studies for a training program to achieve these goals. Group A, consisting of

cabinet officers and directors-general of departments, would work in the course for eight weeks. Group B, consisting of a larger number of middle-level officials (division heads and technical experts) from the same countries would continue beyond the first 12 weeks for a total of 20 weeks. Four substantive courses were proposed: (1) Telecommunications and the International Order; (2) International Negotiating Procedures: Strategies and Tactics; (3) Current Realities in Telecommunications Planning and Operations (in which telecommunications hardware and software would be demonstrated and analyzed); (4) Telecommunications Policy: Theory and Practice. In addition separate seminars for Groups A and B were planned. A broadly based list of required readings were prepared for each course. The emphasis for the first eight weeks would be on the ITU's history, structure and the appropriate strategies and tactics for working at its proceedings. In the second (12 week) period, emphasis would be less on the policy level and more on hardware and software operation and maintenance, and the technical aspects of procedures, negotiations, and drafting of resolutions. In the 8th and 20th weeks moot international radio frequency conferences would be held in which trainees playing roles would conduct moot ITU conferences.

It was proposed to fund the training program contract by grants from Third World countries, international agencies (UNESCO, ITU, World Bank), the Non-Aligned Movement, Organization for African Unity, the Organization of American States, and other intergovernmental organizations, as well as private foundations. While its authors submitted it in various intergovernmental channels, it has not yet become a going concern. This is not surprising in light of the fact that training programs for Third World countries conducted by the industrialized countries have been heavily biased in political and economic terms by their keen commercial and political rivalry, and seem to have pre-empted the institutional channels through which our proposal would naturally go.

CONCLUSIONS

(1) The radio spectrum is a unique resource because of its direct multiplier consequences: (a) its domestic control makes possible self-reliant and independent development; or (b) failure to achieve and maintain domestic control of it leads to military immobilization, ideological, economic and political penetration and dependency.

(2) The radio spectrum is also unique in that *all* countries have the legal right to participate with one vote in determining the services, standards and allocation of frequencies for its use. Legally, the radio spectrum is the common property of the world's peoples.

(3) The use of the radio spectrum as the exclusive basis for private commercial use (e.g., radio and TV broadcasting) generates economic rent in the form of profits now privately appropriated. This economic rent arises from the progress of all elements in society and not from entrepreneurial ability. The ownership of the radio spectrum rests with all humanity. Therefore, taxes, levies or other means of recovering part or all of such rent should be used, the proceeds of which should be provided equitably according to the needs for development of communications especially in the Third World.

(4) Presently, the use of the radio spectrum is very asymmetrical, with the advanced industrial countries dominating it in order to maintain or increase their informal empires through economic, cultural and military means.

(5) Third World countries' participation in policy-making in the ITU process has been increasingly effective since the 1960s when they began to organize co-operatively through regional and global organizations, including conspicuously the Non-Aligned Movement.

(6) Positive *a priori* planning through the democratic process in the ITU versus the first-come first-served policy favoured by the highly industrialized countries is the site of the ongoing struggle over the management of the radio spectrum. A prime device of the industrialized countries is to reduce real political and economic issues to the disguise of a proclaimed neutral 'technology'. 'Technology' is referred to as if it were an autonomous, exogenous force to which people must submit. This notion was originated by the TNCs over the past century. This one-word slogan represents the TNCs' combination of capital, science, engineering, bureaucracy, ideology and propaganda. It is a priceless disguise for monopoly capitalism just as 'technology transfer' tends to be a sterilized substitute for 'imperialism'.

(7) In their struggle for autonomous development, Third World countries are handicapped by lack of preparation for their work in ITU conferences, and in the committees and working groups which meet between the large conferences. It is in these groups that the industrialized countries compose their diverse purposes and produce agreed-upon technical reports which in effect are *faits accomplis.* Third World countries, not having participated in the committees, tend to be overpowered by the resulting illusion of a seemingly inexorable engineering necessity.

(8) Because of such tactics the industrialized countries may be generating so much pressure for an integrated digital worldwide network that Third World countries may accept this digital/computer 'technology'. That 'technology' is doubtless efficient for the branch plants of TNCs operating within Third World countries. But presently and for the foreseeable future a more cost-efficient solution to the

communications needs for self-reliant development in those countries would be plain old telephone and telegraph service via microwave and wire lines. The debt burden they may assume now to pay for this very expensive high-tech equipment will be an extra burden on their indigenous populations and counter-productive to self-reliant development in most cases.

(9) In ITU deliberations, the lack of influence of most Third World countries is caused by the smallness of the delegations they send. The size of country delegations is not only the most important variable explaining delegation influence but is highly correlated with the experience of the delegates and the country's productivity in preparing proposals and plans at ITU conferences.

(10) Lack of experienced senior and middle level Third World officials is caused by a number of factors which are explained. A proposal by Tran Van Dinh and the present author for a Third World sponsored training program for such officials is described.

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