

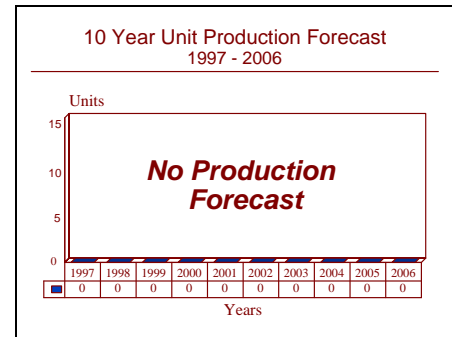
ARCHIVED REPORT

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PRC-104(V) - Archived 7/98

Outlook

- Production complete
- No further production expected
- This report will be dropped from future supplements



Orientation

Description. High-frequency manpack transceiver.

Sponsor

US Navy
Space and Naval Warfare Systems Command
(SPAWAR)
Washington, DC
USA
(USMC/Navy Program Management)

US Army

Communications & Electronics Command
Ft Monmouth, NJ
USA
(Army Program Management)

Contractors

Hughes Electronics Corp
Hughes Aircraft Co
1901 W Malvern Avenue
Fullerton, California (CA) 92634
USA
Tel: +1 714 732 3232
Fax: +1 714 732 0286
(Prime: Production)

Rockwell International Corp

Collins Avionics and Communications Division
350 Collins Road NE
Cedar Rapids, Iowa (IA) 52498
USA
Tel: +1 319 395 5100
Fax: +1 319 395 5429
(Development)

Status. Production completed.

Total Produced. Approximately 15,000 units produced.

Application. The US standard "A" 20-watt manpack HF transceiver now in service with all branches of the US military. Forms part of the US Army Improved High Frequency Radio (IHFR) family.

Price Range. US\$14,000.

Technical Data

| Dimensions (PRC-104B) | Metric | US |
|-----------------------|---|----------------------------|
| Size: | 31.75 cm x 26.67 cm x 6.66 cm | 12.5 in x 10.5 in x 2.6 in |
| Weight: | 6.36 kg | 14 lb |
| Frequency: | 2.0000 to 29.9999 | |
| Channels: | 280,000 in 100-Hz steps | |
| Modes: | Voice/Data/CW, LSB, USB, rec only, AM & low power options | |
| Frequency Stability: | .5 part 10 ⁶ | |
| Temperature Range: | -46°C to +71°C (operating) | |
| Antenna Tuning: | automatic, 3 seconds average | |
| Antennas: | Whip, long wire, dipole, AS-2259 NVIS | |
| Data Rate: | 300 WPM TTY (FSK) or burst CW | |
| MTBF: | More than 2,500 hours demonstrated | |
| MTTR: | 15 minutes (modular level replacement) | |
| Supply Voltage: | 20 VDC to 32 VDC | |
| Environmental: | Meets applicable requirements of MIL-STD-810B for shock, vibration, dust, humidity, leakage, and fungus | |

Design Specifications. Weighing less than 14 pounds, the PRC-104(V) uses advanced-technology, Large Scale Integrated (LSI) circuitry in a highly reliable, space-saving modular package. This has brought about dramatic improvements in operational simplicity, mobility, ruggedness, and tactical flexibility over current generation battlefield tactical radio equipment. Moreover, the modular design makes possible further upgrades in performance with advances in the state of the art.

As a basic manpack, the PRC-104(V) is composed of three compact subsystems: the RT-1209/URC receiver/exciter, the AM-6874 amplifier/antenna coupler, and battery pack. These units latch together to form a light-weight, rugged manpack system, easily carried in a standard rucksack or packframe.

The RT-1209 receiver/exciter is also used in several other US standard tactical HF radios: (1) GRC-213 IHFR (vehicular), (2) higher powered 150-watt mobile US Air Force GRC-206, and (3) 400-watt GRC-193A element of the IHFR.

The PRC-104(V) interfaces with existing MIL-standard accessories. Its fully automatic digital tuning permits Upper Sideband (USB), Lower Sideband (LSB), Continuous Wave (CW), or Data modes; plus optional Amplitude Modulation Equipment (AME) operation on any of 280,000 channels from 2.0000 to 29.9999 MHz. Typical tuning time is less than three seconds.

The PRC-104(V) has repeatedly exceeded its design failure rate of 2,500 hours Mean-Time-Between-Failure (MTBF), and recent field experience in Europe has shown a constant MTBF rate of 4,500 hours.

Operational Characteristics. The US Air Force PRC-104(V)s are being used by personnel assigned to ground troops. Specific missions include coordinating fighter-bomber aircraft support of front-line troops, issue to recon patrols to relay information, and also to direct missions involving parachute drops. In US Army configuration, the PRC-104(V) is part of its IHFR family.

Variants/Upgrades

PRC-104B. As an enhancement to the Army's IHFR program, Hughes developed the Short-Term Anti-Jam (STAJ) modification kit for the PRC-104. STAJ was developed to provide the Army HF radio operator with a swift response to current and projected threats to tactical HF radio operations from communications jammers. The STAJ kit was designed to make maximum use of the Army's existing IHFR radio assets and integrated logistics system, thus reducing costs considerably.

The STAJ improvements were to provide a sophisticated anti-jam capability while keeping their normal HF SSB, CW and data features. STAJ changes to the PRC-104 included an improved modulator/demodulator, new electronic front panel and faster synthesizer to give medium (groundwave) and slow (skywave) frequency-hopping capabilities. The PRC-104B contains 20 preset hop nets, six preset channels, preset channel scan, and a passive net entry method. The key addition is a COMSEC controller module or appliqué, that actually

performs the anti-jam function. Hughes produced the PRC-104B as a STAJ-compatible unit. The module was

to be supplied by a subcontractor; however, this part of the program was canceled by the US Army.

Program Review

Background. Hughes shared competitive development of the PRC-104 with Collins Defense Communications of Iowa. Hughes received US\$350,000 for three prototypes; the Collins award was unannounced. In FY74, Hughes was awarded US\$22 million for up to 5,000 units.

Moderate procurement continued rather steadily through the early 1990s. The last sizable contract was awarded in September 1988, when Hughes was issued a three-year contract to provide 503 PRC-104s and other equipment for US\$24 million.

The Marine Corps has equipped its Mobile Electronic Warfare Support System (MEWSS) vehicles with the PRC-104. The MEWSS will supply tactical commanders with responsive, mobile and survivable EW support during amphibious operations and subsequent operations after the beachhead is established.

During Operation Desert Storm, the IHFR family was deployed with various US ground forces, including USAF Tactical Air Control Parties (TACPS), for coordinating air support among allied units. The radios were well received by their users, demonstrating reliability and longer range that proved essential during desert operations. The long-range nature of HF communications gear is well suited for the wide-open areas of the desert, making it particularly attractive to potential Middle East buyers.

The PRC-104 proved a fine improvement over the PRC-70, a radio that emitted a unique electronic fingerprint that made no secret of Special Forces' presence in the area, a flaw that led the Army to adapt the PRC-104 as standard.

In November 1990, the Army awarded Harris Corp the development contract for the Joint Advanced Special Operations Radio System (JASORS) that was designed to supersede the several radio types in SOF service, including the IHFR, starting in 1995/1996. JASORS was designed to operate across several frequencies including HF, UHF, SATCOM, FM/AM, and SHF; and can duplicate the frequencies of radios used commonly around the world, making it difficult for SOF teams to be detected. While JASORS proved to be an interesting consolidation of these and many other technologies (and proved itself quite effective in testing), its billion-dollar price tag killed it. While the need for a new system persists, the nature of future radio development will largely depend upon the funding available; most likely the next several years will emphasize upgrades rather than new-development projects. Still, certain key technologies may be harvested from the JASORS program for use in Harris projects.

Funding

With production now complete, no additional procurement funding is anticipated. Spares and support funding for the PRC-104(V) is included within US Army Operations and Maintenance accounts and is not broken out as an individual line item.

Recent Contracts

| Contractor | Award (\$ millions) | Date/Description |
|------------|------------------------|--|
| Hughes | 0.9 | Oct 1990 — PRC-104 radios and/or components (N00039-87-C-0211) |
| Hughes | 0.8 | Feb 1991 — PRC-104 radios and/or components (N00039-87-C-0211) |
| Hughes | 0.9 | Jul 1991 — RC-104 radio components (N00039-87-C-0211) |
| Hughes | 0.9 | Dec 1991 — C-104 radio components (N00039-87-C-0211) |

Timetable

| | |
|------|--|
| 1974 | Initial Hughes contract awarded |
| 1976 | PRC-104 introduced |
| 1978 | Marketing rights granted overseas to Rediffusion (UK, Africa, parts of Asia and Middle East) |
| 1979 | IHFR requirement established |
| 1983 | Four advanced adaptive radios to the US Army delivered |
| 1985 | Development of Electronic Counter-Countermeasures for PRC-104 continued. Anti-Jam Improvements for PRC-104 made |
| 1986 | Hughes announced new long-range configuration for the PRC-104(V). Decision made to equip Marine Corps MEWSS vehicles with PRC-104(V) |
| 1992 | US procurement completed |

Worldwide Distribution

In addition to the **US** armed forces, **Israel, New Zealand, Niger, Spain, Sweden**, and certain **Middle Eastern** countries have purchased undisclosed numbers of the PRC-104.

Forecast Rationale

Production of the PRC-104 was completed in 1992. Of the three IHFR radios, i.e., the PRC-104, GRC-193 and GRC-213, production through 1992 was 23,000 units.

The production breakdown for the three types has not been released by Hughes, but it is believed that the PRC-104 received the bulk of the production orders of about 15,000 units.

Ten-Year Outlook

With production complete, the forecast chart has been omitted. Activity is limited to spares and support. Barring a surge in activity over the next 12 months, this report will be omitted from future supplements.

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