Review of Data Processing:

Storage:
A two-channel Magnecord PT6 used to date.
Data recorded (in direct fashion) on 1 chan.
Digital time-code gen. (EECO) indexing time
once per second in 24 hour time code on 2 chan.

BYE 61246-92

Tape speed of 7.5 ips adequate for freq. resp.
of receiver bandwidth.
Each recorder carefully checked out before leaving lab.

What are the most impt. qualities which the data
storage system should possess? Freq. resp. & dynamic
range are impt., xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxx and recorder performance is good enough
for these parameters.
The re-establishment of a perfectly uniform time base during playback is
very desirable, and in this respect, the recorder performance is marginal.
Why is a good time base so important? Because we want to precisely re-establish
PRF and Scan Rates, to permit optimum sorting. Time base must also be accurately
indexed to absolute time.
Digital techniques have high potential for synthesizing an accurate time base,
but are complex & very inefficient in "packing factor", furthermore, digitization
prior to recording can adversely affect S/N ratio. Our analog storage approach
has paid off well so far.with respect to reliability...not a failure so far.
Our processing techniques have be concentrated on two items:
    a. Recreate the best time base possible, & determine how good it is.
    b. Obtain readings on bursts consisting of only 2 or 3 pulses.

Time code is used as reference in a phase-locked servo playback system to
assure correct "average" playback velocity.
A spinning magnetic head is used to repeatedly sample the pulse trains, as the
tape is slowly drawn over the head, thus effectively lengthening the trains, and
permitting the use of very narrow band analysis filters, and making a more easily
discernable mark on a graphic presentation. The spinning head also permits
independent variation, effectively, of the time and frequency domains.
The output of the spinning head is fed to a Rayspan comb-filter analyzer.
    (Show SAMPLE RAYSPAN RECORDS)
We have said, we want to know PRF & Scan rate as accurately as possible, in order
to identify consecutive burst of individual radars & relate them to absolute time
to permit geographic location, xxxxxxxxxxxxxxxxxxxx in addition to xxxxxxxxx
PRFx& simply obtaining PRF and scan-rate values for the radar. Xxxxxxxxxxxx

We are approaching this problem by:
    a. carefully determining the PRF & Scan-rate accuracies obtainable from
       the Rayspan records, and then:
    b. Reading the records manually, and by machine (near future)
    c. Xxxxxxxxxx Two types of computer programs are being used, one for fixing
       xfxxx scan-rate sorting and one for fixing after scan rate sorting.
    d. Most scan-rate sorting to date has been manual from the Rayspan, but in
       about 6 weeks time we plan to be reading the Rayspan records by machine,
       (operator assisted) and xxxxxxxxxxxxxxxxxxxxxxxxxxxx achieving scan-rate
       sorting by digital computer. As a parallel effort, NSA is planning to
       use a strip-film record from which to read out data for the two computer
       programs. ... he on completely auto sorting from the record, but not for
       ... future.

How good are Rayp[...] rec[...] how histograms)
xxxxxx Precision test ta[...] for this calibration, & run thru complete system.
PRF accuracy: max variat[...] & minus 1 % , std. dev. about 0.6 %
Time accuracy: max var. about plus & minus 2 %, xxxxxxxxxxxxxxx over all runs,
but much better over a single run so that if time calibration is effected at
beginning and end of each run, the max. var. is about plus & minus 1 %, referenced
to one second intervals.

Go to Room 208 to see hardware, then return for summary.
(describe hardware in detail)

Summary:(Room 119)
I: Show "Brief" results on 35 runs (half of total) representing 14 missions.

II. Show new scan-sort technique.

III. Introduce Bruce.

FUTURE   PLANS:

xxxxxxXxxxxxxxxx

Use 1/2 inch wide mag tape with 7 channel capability,
xxxxxxxxxxxx
Pull tape at 30 ips to permit xxxx recording of "fine grain" time reference of
50 kc in addition to time code gen. The fine grain time base will permit electronic
defluttering of short term time errors...our major error at present. Also, it can
serve as a clock track for possible future automatic readout.
Data to be recorded on FM channels, & time code on FM
"Direct" record channels for "fine grain" time reference, voice, & time-std.
broadcasts.

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Both dropouts & interchannel crosstalk appear as effective time jitter...studies
are underway to minimize these.

Goals: PRF to 4 significant dec. places
        Estab. burst time to 0.005 sec. or better.